REMARKS

Claims 1-4 are now in the application. Claims 2-4 have been amended for purposes of clarification and/or for proper dependency language and not to limit their scope. A new Abstract has been provided as requested as requested by the Examiner. The amendments do not introduce any new matter.

Claims 1, 2 and 4 have been rejected under 35 USC 102 (d) over applicant's EP 166613, NO 200601067 and MX 2003006955 and WO 2005028687. This rejection is not deemed tenable since the present application is the US national stage of PCT/MX2004/000054, which in turn claims priority from Mexican application PA/a/ 2003006955. The priority documents are to be provided to the USPTO by the International Office since this application is a national stage application. In addition, priority has been properly claimed both in the PCT and in this application in the ADS and preliminary amendment that have already been filed. Moreover, the rejection over the EP, NO and MX references is not even proper since this application is a national stage application of PCT/MX2004/000054, which has an earlier filing date than the publication dates of EP 166613, NO 200601067 and MX 2003006955. Furthermore, this rejection since it is under 35 USC 102(d) would only apply to already issued patents not merely applications published less than a year prior to the filing date of this application.

Claim 1 and 4 were rejected under 35 USC 102(b) as being anticipated by the publication to Urbanski et al. (hereinafter "Urbanski"). Urbanski does not anticipate claims 1 and 4. In particular, Urbanski mentions the following in the first section (Introduction): *"Moreover, the gold leaching with thiourea must be carried out in the presence of an oxidant. The first sep of the thiourea oxidation to formamidine disulphide (RSSR) is reversible and even useful because RSSR is a good oxidant for gold....."*. These last statements are common knowledge for those who work in this technology. However, Urbanski does not mention here that the RSSR is produced by an electrolytic oxidation of the thiourea. On the other hand, the most common procedure uses a chemical oxidation of the thiourea with ferric ion, hydrogen peroxide or another moderately strong electrolyte. Afterward, the leaching of the precious metals (gold and silver) takes place.

The process according to the present invention relates to electrolytically oxidizing the thiourea to RSSR exclusively; a procedure which offers the advantage of being completely controllable, in order to prevent the destruction (irreversible oxidation) of the thiourea, and does not introduce an external oxidant which could contaminate the solution.

After the oxidation reaction of gold with the RSSR and thiourea, Urbanski describes procedures for the recovery of gold from the leaching solution, among which are included adsorption on activated carbon and ion exchange. One study (Brandon, et al, Hydrometallurgy, vol. 18, p.305, 1987) is cited in Urbanski, where the direct electrowinning of gold and silver from dilute solutions is considered be uneconomical. To the contrary, in the present invention, the direct electrowinning of gold and silver is achieved, using the same electrical energy (current) that is employed to partially oxidize the thiourea en a coupled cell. For this reason, the present invention is economically more favorable, in comparison to other processing schemes.

In this sense, Urbanski mentions the activated carbon adsorption procedure to recover the gold complexes, which are later desorbed into aqua-alcoholic solutions of thiourea. It is from these solutions that Urbanski et al. carry out their electrowinning studies. Here the reductive reaction involved in this step of the process is presented and it is stated that, if the anodic and cathodic compartments are not separated, "thiourea present in the solution can be partially oxidized at the anode, but its first oxidation product, RSSR, may be reduced on the gold deposition surface. The irreversible, further, anodic oxidation of thiourea is possible in time, which may deposit elemental sulfur on the cathode. Gold redissolution can occur by the action of RSSR oxidant as can hydrogen evolution which could diminish the rate of gold deposition. A membrane can then be used to separate the cathode compartment from the anode compartment".

Urbanski, in turn, cites 17 articles that describe the advantages of using membranes to prevent the redissolution of the gold deposited on the cathode.

On the other hand, Urbanski refers to the negative properties of RSSR on the electrodeposited gold, which can be avoided by employing a membrane to separate the

compartments (it is worth noting that Urbanski et al. did not perform their experimental work with separate compartments and only speculate in this sense at the end of the article (p. 151) that the results of the electrowinning could be improved by using a membrane to separate the compartments, if and only if adequate mixing is maintained in both compartments. In the case of the present invention, the thiourea is electrolytically oxidized in the anodic compartment, separated by a membrane, with the sole intention to use it for dissolving the gold and silver contained in minerals. In other words, as a benefit to the integral process. At no time; do Urbanski et al., nor others of any study reported in the literature, use RSSR, electrolytically produced in-situ, to leach gold and silver from minerals. Additionally, in the process of the present invention, the novelty of coupling both processes, the electrolytic production of RSSR and the electrowinning of gold and silver, in the same cell with the same energy, is introduced.

Finally, it is worth mentioning that Urbanski, on page 138 (referred to in the Written Opinion in the International stage), is only a conventional survey of the literature pertinent to the topic and does not contribute new results on an integral process for the leaching and electrowinning of precious metals. The information contained on page 146 and in Table 2, refers to the Urbanski's results only in the electrowinning stage. Below is a table, which summarizes the observations that appear in the Written Opinion during the International stage of the PCT and our respective comments.

Table – Summary of the comments appearing in the Office Action regarding the document Urbanski, T.S. et al. Hydrometallurgy. Vol. 55. pages 137-152 and the reply to these.

Location in Urbanski		1. COMMENT	2. REPLY
page	lines		
138	3-36	The document describes the electrolytic extraction of gold from aquo-alcoholic solutions of thiourea that, in the first step, is partially oxidized in-situ to formamidine disulfide (DSFA). Said oxidation is carried out in the anodic compartment, being that formamidine disulfide is a good oxidant for gold.	In this section (Introduction), Urbanski et al. summarize the information available in the literature, which is, for the most part common knowledge for the researchers in this field. The original contributions of this article appear starting from page 140 and refer to the gold electrowinning, from aqueous-alcoholic thiourea solutions originating from the desorption process (not from leaching), in an undivided cell with only one compartment (no membrane). Because of this, the thiourea is partially oxidized, which negatively affects the deposit. Urbanski et al. do not oxidize the thiourea in the anodic "compartment", rather at the anode and do not employ the resulting solutions for leaching. In the conclusions (p. 151, lines 29-30), the authors recognize that they did not even observe the formation of RSSR (DSFA).
146 and Table 2	19-24	The kinetics of the electrolytic extraction of gold is studied on different cathodes: platinum, stainless steel and graphite.	The electrolytic extraction to which the authors are referring is in reality electrowinning (electrodeposition) on different materials, which are not claimed as a novelty in this invention.
151	10-14	The electrowinning process is improved by the separation of the anodic and cathodic compartments with a membrane, when the solutions in both compartments are well mixed.	As was previously mentioned, the separation of the anodic and cathodic compartments was suggested by Urbanski in order to reduce the negative effects on the electrodeposited gold of the RSSR produced, not for its use as a leaching agent for minerals.

138	35	The thiourea, formed by the reduction of formamidine disulfide (DSFA), is recirculated to the anodic compartment.	No reference to this procedure was found in the text.

Claim 2 was rejected under 35 USC 103 (a) as being unpatentable over Urbanski et al. in view of GB 2,349,876. The cited references do not render obvious claim 23. GB 2,349,876 does not overcome the above discussed deficiencies of Urbanski with respect to rendering unpatentable the present invention.

GB 2,349,876 states in the Summary of the Invention (p. 3, line 24 to p. 4, line 1): "The present invention provides a process for the hydrometallurgical recovery of noble metals from materials containing them by lixiviation with an aqueous acidic solution of thiourea in the presence of an oxidising agent and a reducing agent characterised in that the concentrations of thiourea and of formamidine disulphide in the solution are determined and an amount of oxidising or reducing agent is added to the solution to maintain the molar ratio of thiourea: formamidine disulphide to between about 2: 1 and 5: 1. It has been found by the present inventors, that under such condition, high extraction, in the region of 90% in the case of gold, for example, can be achieved in relatively short reaction times while at the same time the irreversible degradation of thiourea may be suppressed. Not only may the loss by chemical degradation of thiourea be significantly reduced but, perhaps more importantly, by avoiding sulphur precipitation the passivation of noble metal particles by the coating of reaction surfaces with sulphur is avoided." The aforementioned discussion refers to the addition of agents, oxidising or reducing, in order to maintain the Thiourea (Tu): Formamidine disulphide (FADS).

GB 2,349,876 also states in the Abstract: The oxidising agent may be ferric ion or hydrogen peroxide, the reducing agent may be SO_2 or metabisulphite and the acid may be sulphuric" and furthermore in Claim 1 (p. 11, lines 7-9) states: "... and an amount of oxidising agent or reducing agent is added to the solution to maintain the molar ratio of thiourea: formamidine disulphide to between about 2:1 and 5:1." In the examples, GB 2,349,876 employ both hydrogen peroxide and metabisulphite, as additives.

The process of the present invention is concerned with electrolytically oxidizing the thiourea to FADS exclusively, a procedure which offers the advantage of being completely controllable, in order to prevent the destruction (irreversible oxidation) of the thiourea, and does not introduce an external oxidant which could contaminate the solution.

Regarding the recovery of the values from the solution, GB 2,349,876 mentions only several alternatives, which are common procedures in the industry and are not claimed in their patent, stating (p. 6, lines 10-14): "The noble metal values may be stripped or recovered from the leachate by any means including: Carnon-in-Leach (CIL), Carbon in Pulp (CIP), cementation onto iron or aluminum; by adsorption onto biomass or ion exchange resin; or obtained by direct electrowinning or by other methods known to those skilled in the art." In the process of the present invention, the novelty of coupling both processes, the electrolytic production of FADS and the electrowinning of gold and silver, in the same cell with the same energy, are introduced and recited in claim 2. The present invention contributes an integral process for the leaching and electrowinning of precious metals.

In view of the above, consideration and allowance are respectfully solicited.

In the event the Examiner believes an interview might serve in any way to advance the prosecution of this application, the undersigned is available at the telephone number noted below.

The Office is authorized to charge any necessary fees to Deposit Account No. 22-0185, under Order No. 21879-00063-US1 from which the undersigned is authorized to draw.

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Respectfully submitted,

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